REMARKS

PRESENT DISCLOSURE

Figures 1A and 1B show a helical fastener 10 twisting counterclockwise a full turn. Helical fastener 20 twists clockwise a quarter turn. Fasteners 10 and 20 are elongated and do not terminate at either end in a large, wider structure. Instead, both ends are formed into small tips.

These helical fasteners are fairly regular and spiral about a central axis; i.e., exhibit an angular displacement simultaneously with a change in depth.

The depressions 13 and 23 are described in the specification as slotted caps. These helical fasteners can screw into matching helical tunnels; for example, prong receptors 16 and 17.

§ 112 AND SUPPORT IN SPECIFICATION

The examiner objects that the specification does not show a prong rotating clockwise and a prong rotating counterclockwise as provided in claim 17. However, Figures 1A and 1B show this feature as noted above. See also the original specification at page 6, line 1-5. To avoid a potential technical objection, claim 17 was amended to provide "said first prong and said second prong being adapted to commonly fasten onto said fastenable material."

Examiner also objects that the specification does not support "where the cap is slotted" as provided in claim 16. A slotted cap is described in the original specification on page 6, lines 1-4. As noted above this slotted cap is illustrated in Figures 1A and 1B as

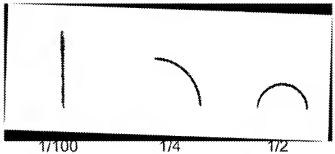
depressions 13 and 23. Perhaps the examiner would prefer different language. For this reason, claim 15 was amended to recite, not a slotted cap, but a "cap having a depression overlying said prong." Applicant will be pleased to consider any alternative language the examiner may propose.

The term "the helix" was removed from claims 7 and 8.

BUSH (U.S. Patent 4,518,277)

Structural half columns 11 can be interconnected using the substantially identical, L-shaped teeth 15 and 15a on the spring-biased, rotatable rings 14 and 14a . (L-shape cited at column 4, line 37.) The rings 14 and 14a are held open against the closing force of springs 16 and 16a by latches 32 and 32a. As the two half columns 11 are swung about hinge 20, at first the teeth 15 and 15a interdigitate without interlocking. Eventually latches 32/32a are automatically released so that springs 16 and 16a cause the L-shaped teeth 15 and 15a to engage.

The relative rotation of rings 14 and 14a is extremely small, less than 1/100th of a turn. Figure 4 shows that the underside of teeth 15 have less than 4.5° of clearance. Thus, if both rings 14 and 14a rotate the same amount, each rotate 2.25° or about 1/160th of a turn. If the relative rotation were unbalanced, one of the rings 14 or 14a might rotate almost 1/100th of a turn. To appreciate how small 1/100th of a turn is, consider the following arcs, done with protractor, compass and circle template, to show 1/100th, one-quarter and one-half turn for equal length arcs:



If we have a prong of some fixed length and turn it 1/100th of a turn, it is indistinguishable from a straight line for all practical purposes. Such a prong cannot be screwed into some fastenable material. The above first diagram shows we are then dealing with what is essentially a nail. With the same prong length, a 1/4 turn and 1/2 turn produce significant turning and achieve the ability to screw into material.

Bush's L-shaped teeth are not helical. L-shaped teeth 15 and 15a each have a tapered, axially extending root supporting a tapered, circumferentially extending cantilever. See Figure 2 and column 5, lines 25-29. The root does not turn or twist since its leading edge is completely axial and reaches from minimum to maximum at the same angular position. Thus the root cannot screw into any material.

The cantilever turns ever so slightly but does not progress axially like a helix. Its distal surface is perpendicular to the turning axis and is therefore reaches its maximum immediately. Also, the cantilever has a leading edge that is axial, a bevelled trailing edge, and a bevelled underside. The bevelled underside and bevelled trailing edge combine to produce circumferential thickening. The bevelled trailing edge and axial leading edge combine to produce circumferential narrowing. Thus, the circumferential tapering of the cantilever ruins the opportunity for effective screwing and unscrewing

KATZ (U.S. Patent 5,624,167)

A washing machine has a mounting plate 15 with tapered arcuate slots 44 and 45. A timer 17 has a pair of ears 32 and 33 that are parallel to plate 15, except for downturned corners 34. Thus ears 32 and 33 are not helical and do not have a turning or twisting shape.

Ears 32 and 33 are inserted through slots 44 and 45 and ride under plate 15 as timer 17 is rotated. This rotation simply wedges the perpendicular branches supporting the ears 32/33 into the narrow portions of slots 44 and 45.

Also, rotation of timer 17 does not pull it closer to plate 15 with a screw-like action.

MORRISSEY (U.S. Patent 6,520,464)

The flexible arms 40, 42 and 44 on hex collar 14 can be driven inwardly against cylindrical housing 16. Specifically, L-shaped lugs 46, 48 and 50 hook around and slide on circumferentially spaced ramps 22, 24 and 26. When collar 14 is rotated lugs 46, 48 and 50 climb the ramps 22, 24 and 26 and thereby drive arms 40, 42 and 44 inward against housing 14.

L-shaped lugs 46, 48 and 50 extend axially and radially, but have no twisting or turning component.

CLAIM ANALYSIS

The examiner rejects claims 1, 5, 6, 9, 11, 15, 18, 27, 28, 31-33, 35, 38-40 and 42 under 35 USC 102(b), citing Katz. The examiner rejects claims 1, 5, 6, 9, 11, 15, 16, 18, 31-33, 35, 38-40, and 42 under 35 USC 102(e), citing Morrissey. The examiner rejects claim 17 under 35 USC 102(b), citing Bush. The examiner rejects claims 2-4, 7, 8, 10, 12, 16, and 36 under 35 USC 103(a), citing either Katz or Morrissey.

Independent Claim 1

None of the references show a "short turn prong being elongated and dimensioned to extend to said tip : (a) encompassing at least 1/4 turn about an axis, and (b) throughout said at least 1/4 turn reaching axially a progressively greater amount," as recited in amended claim 1. The L-shaped teeth of Bush extend over less than 4.5° of a turn, nowhere near the 90° minimum implied by the phrase "at least 1/4 turn."

Also, Bush does not show a prong "reaching axially a progressively greater amount" throughout a turn. Bush's L-shaped teeth each have an axially extending root that does not turn (maximum reached without turning). This root supports a cantilevered element that turns circumferentially but without progressing axially. Instead the cantilever immediately reaches its axial maximum and does not progress axially through a turn.

In fact, none of the cited references (Bush, Katz or Morrissey) show a prong axially progressing through a 1/4 turn. Katz's ears and Morrissey's lugs do not twist or turn. Even if they did, their width is much less than 20°, nowhere near the 90° minimum implied by the term "at least 1/4 turn."

Independent Claim 15

As explained above for claim 1, none of the references show a "prong being elongated and dimensioned to reach axially a progressively greater amount by turning about an axis while axially progressing," as recited in amended claim 15.

Also, none of the cited references (Bush, Katz or Morrissey) show "a cap opposite said tip, said cap having a depression overlying said prong," as recited in amended claim 15.

Independent Claim 17

Applicant's Figures 1A and 1B show a plurality of prongs, one rotating clockwise, the other rotating counterclockwise. The references simply do not show prongs with reverse rotation as provided in claim 17.

Independent Claim 18

Amended claim 18 recites:

> each of said prongs being arranged to helically spiral about a helical axis with a circumferential extension and a proportional axial extension in order to allow screwing and unscrewing into the material;

This recitation defines the nature of the helical progression. Amended claim 18 also recites:

> each of said prongs being elongated and dimensioned to reach axially a progressively greater amount by turning about an axis while axially progressing . . . .

This latter recitation is contained in amended claim 1 and therefore distinguishes over the cited art for the reasons previously given in connection with that claim.

Claim 18 was also amended to recite "each of said prongs extending along most of

the predetermined depth without circumferential tapering." Bush lacks this feature since the circumferentially extending cantilever of teeth 15 and 15a initially thickens circumferentially and then narrows circumferentially along axially progressive positions. Also the root of teeth 15 and 15a cannot be prongs because they are not arranged to allow "screwing and unscrewing into the material," as recited in amended claim 18. Specifically, the leading edge of the root is purely axial and cannot screw at all.

Katz's ears and Morrissey's lugs do not twist or turn and are therefore irrelevant.

Independent Claim 32

Amended claim 32 recites "a prong that is elongated and dimensioned to extend by turning at least 1/4 turn about an axis while axially progressing." This recitation is similar to that noted above for claim 1 and distinguishes over the cited references for the same reasons.

Independent Claim 35

Amended claim 35 recites:

> (a) a short turn rotary fastener comprised of a prong having at least one tip, said prong being arranged to both turn about an axis and extend axially; and
> (b) a fastenable material comprised of a prong receptor having a cavity arranged to descend and turn in order to accommodate said prong.

The cited references do not show a prong receptor that descends and turns.

New Dependent Claims

Claims 46 and 51 recite "a substantially constant thickness." Claims 47 and 52 recite "a substantially constant cross-section." Bush's tapered teeth lack this feature.

Claims 48 and 53 recite that the "prong extends helically about said axis with its

angular progression changing in proportion to depth." None of the references show this proportionality. For support of this proportionality, see the first 19 lines on page 3 of the original specification.

Claims 49 and 54 recite that the "prong has a helical centerline." None of the references show a helical centerline.

Claim 55 recites "a pair of tips at opposite ends of said prong, said prong being elongated." The references only show a tip at the distal end. The proximal end merges into a larger structure, not into a tip. Claim 50 recites similar language (the "prong is elongated and has an opposite pair of prong ends, said primary tip being located at one of said prong ends, the other one of the prong ends having a secondary tip.")

CONCLUSION

The other claims depend from the above noted independent claims and distinguish over the cited art for at least the reasons given in connection with those independent claims.

It is believed that the foregoing fully responds to the objections and rejections entered by the Examiner and places this application in condition for allowance, which action is respectfully requested.

Respectfully submitted,
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CERTIFICATE OF TRANSMISSION UNDER 37 CFR 1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office on this 18th day of September, 2007.

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